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## PLASMA DEPOSITED OPTICAL WAVEGUIDE

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### Abstract of the Disclosure

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An optical element, such as a waveguide, is formed by utilizing a plasma deposited precursor optical material wherein the plasma deposition is a two-component reaction comprising a silicon donor, which is non-carbon containing and non-oxygenated, and an organic precursor, which is non-silicon containing and non-oxygenated. The plasma deposition produces a precursor optical material that can be selectively photo-oxidized by exposure to electromagnetic energy in the presence of oxygen to produce photo-oxidized regions that have a selectively lower index of refraction than that of the non-photo-oxidized regions whereby transmission of a light signal through selected non-photo-oxidized and photo-oxidized regions can be controlled. Subsequent photo-oxidation or variable photo-oxidation can be used to produce various discrete regions with different indexes of refraction for fabrication, optimization or repair of photonic structures.